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Climate Change:

Implications for the Energy Sector

Key Findings from the
Intergovernmental Panel on Climate Change
Fifth Assessment Report

June 2014

UNIVERSITY OF CAMBRIDGE
Cambridge Judge Business School
Cambridge Institute for Sustainability Leadership

WORLD ENERGY COUNCIL
CONSEIL MONDIAL DE L'ÉNERGIE
For sustainable energy.

Climate Change: **Key Findings**

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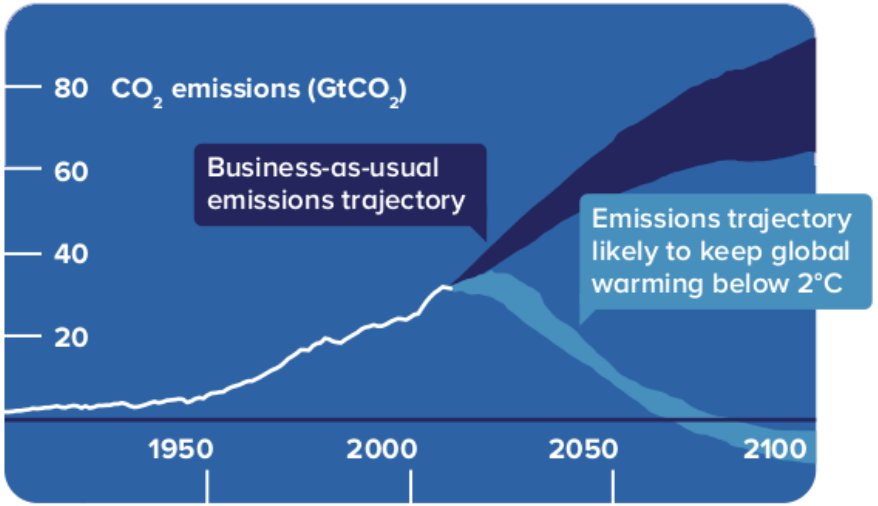
Energy demand is increasing globally, causing greenhouse gas (GHG) emissions from the energy sector also to increase.

Emissions at current rates are projected to **raise global average surface temperature by 2.6–4.8°C** by 2100.

Strong global political action on climate change would have **major implications** for the energy sector.



Climate Change: **Implications for Energy**

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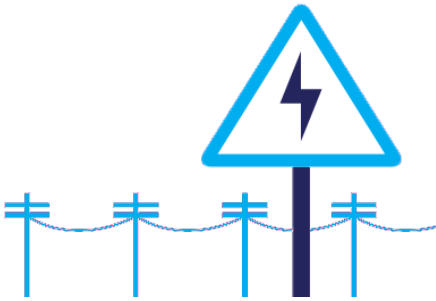
Energy demand is increasing due to:

- Rising **population**
- Economic **growth**

The long-term trend of gradual decarbonisation of energy has reversed **due to an increase in coal burning**.

Energy production and delivery will be affected by:

- Progressive **temperature increase**
- Increasing and more severe **extreme weather events**
- Changing **precipitation patterns**



Climate Change: **Impacts and Adaptations**

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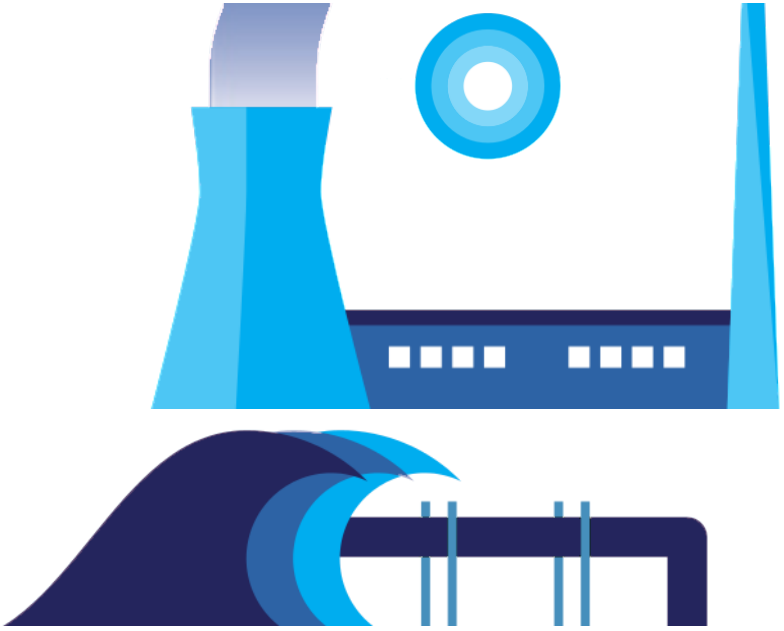
- **Thermal power plants** will be affected by the **decreasing efficiency of thermal conversion** as a result of rising temperatures, as well as **possible lack of water for cooling**.
- **Oil and gas pipelines** will be affected by **rising sea levels** or **thawing permafrost**, and may require new zoning, design or construction.
- **Power lines** are vulnerable to **extreme weather events**, but can be re-routed away from high-risk areas.
- **Renewables** are threatened by changes to regional weather patterns such as **precipitation**, **storms**, and **cloudiness**.
- **Nuclear** may be threatened by **extreme weather events** or **lack of water for cooling**.



Adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

Climate Change: **Emission Reduction**

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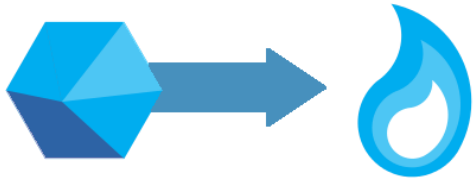
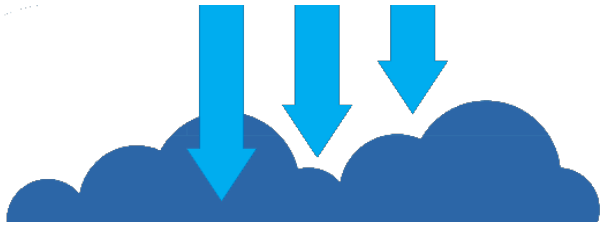
Adaptation options exist. Significant cuts in GHG emissions from energy can be achieved through a variety of measures:



- Cutting fossil fuel **extraction and conversion emissions**
- Switching to **lower-carbon fuels** (e.g., coal to gas)
- Increasing **transmission and distribution energy efficiency**
- Increasing use of **renewable and nuclear generation**
- Introducing **carbon capture and storage (CCS)**
- Reducing **final energy demand**



Climate change presents increasing challenges for **energy production** and **transmission**.

Climate Change: **Mitigation**

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Stabilisation of emissions at levels compatible with the internationally agreed 2°C temperature target **will mean a fundamental transformation of the energy industry worldwide** in the next few decades.

Incentivising investment in low-carbon technologies will be a key challenge for governments and regulators to achieve carbon reduction targets.

Reducing GHG emissions also brings important **co-benefits such as improved health and employment,** but supply side mitigation measures also carry risks.

Climate change will affect the entire energy sector, through **impacts** and through **policy**.

Climate Change: **Policy Framework**

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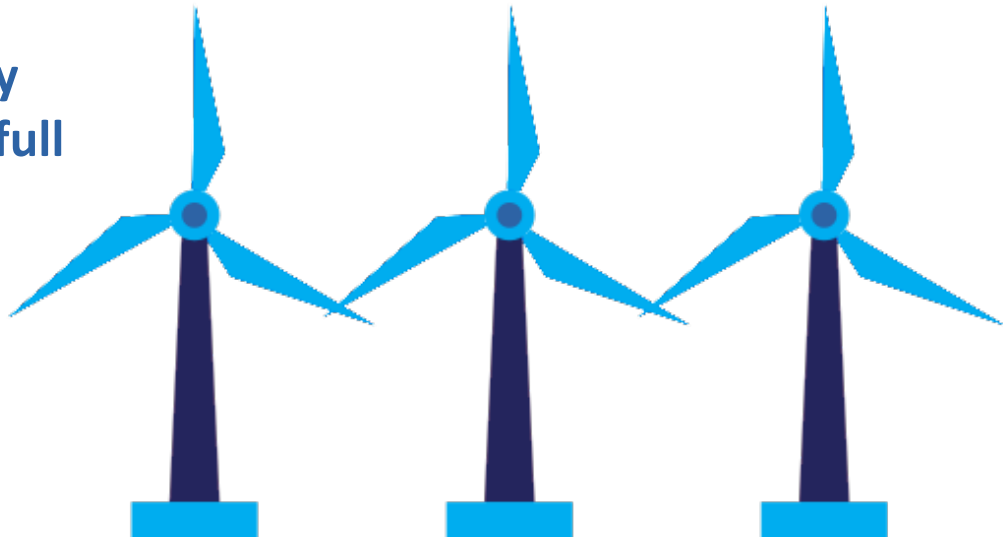
Meeting the 2°C target implies **swiftly halting the rise in emissions for the full energy system** and **bringing them to zero before the end of the century**, with a likely need for 'negative emissions' technology.

Governments may facilitate an increased use of emission reduction options by creating **an attractive fiscal and regulatory framework**.

New technologies can be used for **efficiency improvements**, **power generation**, **extraction**, **storage**, **transmission** and **distribution**.



Low-carbon electricity comes from processes or technologies that produce power with *substantially lower amounts of carbon dioxide emissions* than is emitted from conventional fossil fuel power generation.

For more information

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